

PATENT SPECIFICATION (11)

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(54) IMPROVEMENTS IN AND RELATING TO SECURITY SYSTEMS FOR BUILDINGS

(71) I, ALAN WILLIAM ARTHUR SMITH, a British Subject, of "Tara", 1 Maple Road, Ripley, Surrey, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to security systems such as emergency lighting systems and is particularly concerned with a system which includes an intruder alarm, a fire alarm as well as an emergency lighting system which comes into operation should a main supply to the system fail.

According to the invention there is provided an electrical system comprising terminals for connection to a mains supply of electricity, a battery charger connected for energisation from the said terminals and to supply current to a storage battery, a lighting system which is connected for energisation from the storage battery on the closure of at least two switches, of which one forms part of a relay which acts to close this switch in the event of mains failure as herein defined, and of which a second switch forms part of a relay under the control of a photo-responsive circuit which is connected for electrical energisation to the battery and is operative to operate the relay on the occurrence of insufficient illumination as herein defined.

Preferably the battery charger includes an automatic regulator which cuts off the supply of charging current when the voltage across terminals connected to the battery is above a predetermined threshold and restores charging current when the voltage across the said terminals is below a predetermined threshold which may be the same as or below the aforementioned threshold.

The invention includes within its scope a combined alarm and emergency lighting system including a system as set forth above and further including a fire alarm and an intruder alarm connected for energisation from the battery.

The relay comprising the said one switch

may be adapted for cutting off the battery from the battery charger.

There follows a description with reference to the accompanying drawing of one embodiment of a system arranged in accordance with the invention.

The system shown in the drawing includes a transformer 1 of which the primary winding is to be connected to the terminals of a mains supply. The transformer 1 feeds a rectifier bridge which supplies current to a battery charger 3 which has output terminals 4 and 5. The rectifier bridge also supplies current to the coil 6 of a relay. The terminals 4 and 5 are connected by respective switches 7 and 8 (forming part of the relay) to a storage battery 9 which provides energisation for a photo-responsive unit 10, heat detectors 11, intruder detectors 12 and an alarm system 13 operated by those detectors. A lighting system 14 including a plurality of units, such as unit 15, each including a lamp is normally disconnected but is connectable to the terminals of the battery provided that the switches 7 and 8 as well as a switch 16 forming part of a second relay are all closed. The second relay 17 is operated by the unit 10 if the ambient illumination is insufficient, i.e. falls below some threshold which may be selected as desired. The first relay normally closes connections between the charger and the battery, but if the coil receives insufficient current, thereby denoting too low a mains voltage (i.e. mains failure) the switches 7 and 8 are switched to the positions for connecting the lighting system to the battery. Accordingly, should there be a failure in the mains supply, either by virtue of a fire or the action of an intruder, and emergency lighting is required, the two relays will bring the emergency lighting into operation.

The battery charger 3 provides charging current to the terminals 4 and 5 provided that the voltage across the output terminals 4 and 5, which voltage is monitored by a transistor 18 connected to the potentiometer 19 in series with the Zener diode 20, falls below a threshold which may be

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slightly less than the nominal voltage of the battery. The charging current is cut off when the voltage across the terminals 4 and 5 is slightly higher than the nominal voltage of the battery.

The photo-responsive unit 10 includes a photo-detector 21 and an ancillary circuit 22 which is energised directly from the terminals of the battery. The photo-detector is in circuit with the energising coil of the relay 17.

The lighting unit 15 includes an inverter of which the active element is the transistor 23, which receives direct current from the battery when in operation. The inverter drives a fluorescent tube 24.

Connected in series is a group of alarm and heat detectors constituted preferably by reed switches. The alarm detectors 11 may be fixed in windows or doors with a magnet on any part which may move to operate the reed switch. The heat detectors 12 also comprise a reed switch each with a magnet. Each may be arranged in known fashion to cause opening of the contacts of the reed switch on the reception of sufficient heat. Should any of the reed switches embodied in the various alarm and heat detectors be opened, the current flowing through the series connection of reed switches and a relay coil 25 is broken. The alarm 13, which is connected in series with a "mute-key" switch 26 and the battery terminals. Another pair of contacts of this relay are connected in series with a reset switch 27 and the "mute-key" switch.

The alarm may comprise a flashing light, a siren or like visible or audible alarm.

40 WHAT I CLAIM IS:—

1. An electrical system comprising terminals for connection to a mains supply of

electricity, a battery charger connected for energisation from the said terminals and to supply current to a storage battery, a lighting system which is connected for energisation from the storage battery on the closure of at least two switches, of which one forms part of a relay which acts to close this switch in the event of mains failure as herein defined, and of which a second switch forms part of a relay under the control of a photo-responsive circuit which is connected for electrical energisation to the battery and is operative to operate the relay on the occurrence of insufficient illumination as herein defined.

2. A system according to claim 1 in which the battery charger includes an automatic regulator which cuts off the supply of charging current when the voltage across terminals connected to the battery is above a predetermined threshold and restores charging current when the voltage across the said terminals is below a predetermined threshold which may be the same as or below the aforementioned threshold.

3. A combined alarm and emergency lighting system including a system according to claim 1 or claim 2 and further including a fire alarm and an intruder alarm connected for energisation from the battery.

4. A system according to claim 3 in which the relay comprises the said one switch which is adapted for cutting off the battery from the battery charger.

5. A system substantially as hereinbefore described with reference to the accompanying drawing.

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COMPLETE SPECIFICATION

1 SHEET

*This drawing is a reproduction of
the Original on a reduced scale*

